Listing of Claims

1 – 62. (Canceled)

63. (Currently Amended) A method of detecting a ~~biological condition~~neoplasia associated with an activating platelet derived growth factor receptor alpha (PDGFRA) mutation in a subject, comprising determining whether the subject has an activating mutation in PDGFRA, and wherein the activating mutation comprises a variant nucleic acid sequence shown in one or more of positions 2072 through 2107 or ~~2090~~ 2916 through 2937 of SEQ ID NO: 26.

64. (Currently Amended) The method of claim 63, wherein the activating mutation comprises a variant nucleic acid sequence that results in ~~shown in~~ one or more of the following amino acid variants: substitution D842V (shown in SEQ ID NO: 4); deletion of DIMH842-845 (shown in SEQ ID NO: 6); deletion of HSDN845-858P (shown in SEQ ID NO: 8); insertion ER561-562 (shown in SEQ ID NO: 10); deletion of SPDGHE566-571R (shown in SEQ ID NO: 12); substitution V561D (shown in SEQ ID NO: 21); deletion of RVIES560-564 (shown in SEQ ID NO: 23); and/or deletion of RD841-842KI (shown in SEQ ID NO: 25)~~position 2919 of SEQ ID NO: 3, 2917 and 2918 of SEQ ID NO: 5, 2927 and 2928 of SEQ ID NO: 7, 2075 to 2080 of SEQ ID NO: 9, 2089 to 2093 of SEQ ID NO: 11, 2076 of SEQ ID NO: 20, 2017 and 2072 of SEQ ID NO: 22, or 2916 to 2919 of SEQ ID NO: 24~~.

65. (Cancelled)

66. (Currently Amended) The method of claim [[65]]63, wherein the neoplasia comprises a gastrointestinal stromal tumor (GIST).

67. (Previously Presented) The method of claim 63, comprising:

reacting at least one PDGFRA molecule contained in a clinical sample from the subject with a reagent comprising a PDGFRA-specific binding agent to form a PDGFRA:agent complex.

68. (Previously Presented) The method of claim 67, wherein the PDGFRA molecule is a PDGFRA encoding nucleic acid or a PDGFRA protein.

69. (Currently Amended) The method of claim 67, wherein the ~~PDGFRA-~~PDGFRA-specific binding agent is a PDGFRA oligonucleotide or a PDGFRA ~~protein-~~protein-specific binding agent.

70. (Previously Presented) The method of claim 67, wherein the sample comprises a neoplastic cell or is prepared from a neoplastic cell.

71. (Currently Amended) The method of claim ~~63-~~67 wherein the PDGFRA molecule is a PDGFRA encoding nucleic acid sequence.

72. (Currently Amended) The method of claim 71, wherein the method comprises HPLC denaturation analysis of a PDGFRA encoding~~PDGFRA encoding~~ nucleic acid molecule.

73. (Previously Presented) The method of claim 71, wherein the agent comprises a labeled nucleotide probe.

74. (Currently Amended) The method of claim 73, wherein the nucleotide probe has a sequence selected from the group consisting of:

(a) SEQ ID NO: 3, 5, 7, 9, 11, 20, 22, or 24; or

(b) fragments of (a) at least 15 nucleotides in length, and including the sequence encoding one or more of the following amino acid variants: substitution D842V (shown in SEQ ID NO: 4); deletion of DIMH842-845 (shown in SEQ ID NO: 6); deletion of HSDN845-858P (shown in SEQ ID NO: 8); insertion ER561-562 (shown in SEQ ID NO: 10); deletion of SPDGHE566-571R (shown in SEQ ID NO: 12); substitution V561D (shown in SEQ ID NO: 21); deletion of RVIES560-564 (shown in SEQ ID NO: 23); and/or deletion of RD841-842KI (shown in SEQ ID NO: 25)~~shown in position(s) 2919 of SEQ ID NO: 3, 2917 and 2918 of SEQ ID NO: 5, 2927 and 2928 of SEQ ID NO: 7, 2075 to 2080 of SEQ ID NO: 9, 2089 to 2093 of~~

~~SEQ ID NO: 11, 2076 of SEQ ID NO: 20, 2017 and 2072 of SEQ ID NO: 22, or 2916 to 2919 of SEQ ID NO: 24~~.

75. (Previously Presented) The method of claim 63, further comprising *in vitro* amplifying a PDGFRA nucleic acid prior to detecting the activating PDGFRA mutation.

76. (Previously Presented) The method of claim 75, wherein the PDGFRA nucleic acid is *in vitro* amplified using at least one oligonucleotide primer derived from a PDGFRA-protein encoding sequence.

77. (Previously Presented) The method of claim 76, wherein at least one oligonucleotide primer comprises at least 15 contiguous nucleotides from SEQ ID NO: 3, 5, 7, 9, 11, 20, 22, or 24.

78. (Currently Amended) The method of claim 76, wherein at least one oligonucleotide primer ~~comprises a sequence as represented by~~ is at least 15 ~~contiguous~~ nucleotides in length and overlaps the sequence encoding one or more of the following amino acid variants: substitution D842V (shown in SEQ ID NO: 4); deletion of DIMH842-845 (shown in SEQ ID NO: 6); deletion of HSDN845-858P (shown in SEQ ID NO: 8); insertion ER561-562 (shown in SEQ ID NO: 10); deletion of SPDGHE566-571R (shown in SEQ ID NO: 12); substitution V561D (shown in SEQ ID NO: 21); deletion of RVIES560-564 (shown in SEQ ID NO: 23); and/or deletion of RD841-842KI (shown in SEQ ID NO: 25)~~shown in position(s) 2919 of SEQ ID NO: 3, 2917 and 2918 of SEQ ID NO: 5, 2927 and 2928 of SEQ ID NO: 7, 2075 to 2080 of SEQ ID NO: 9, 2089 to 2093 of SEQ ID NO: 11, 2076 of SEQ ID NO: 20, 2017 and 2072 of SEQ ID NO: 22, or 2916 to 2919 of SEQ ID NO: 24~~.

79. (Withdrawn) The method of claim 68, wherein the PDGFRA molecule is a PDGFRA protein.

80. (Withdrawn) The method of claim 79, wherein the complexes are detected by western blot assay.

81. (Withdrawn) The method of claim 79, wherein the complexes are detected by ELISA.

82. (Withdrawn) The method of claim 79, wherein the PDGFRA protein comprises a sequence selected from the group consisting of SEQ ID NO: 4, 6, 8, 19, 12, 21, 23, and 25.

83. (Withdrawn) The method of claim 79, wherein the PDGFRA-specific binding agent is a PDGFRA-specific antibody or a functional fragment thereof.

84. (Withdrawn) The method of claim 83, wherein the agent is an antibody.

85. (Withdrawn) The method of claim 84, wherein the antibody is a monoclonal antibody.

86. (Withdrawn) The method of claim 85, wherein the monoclonal antibody recognizes an epitope of a variant PDGFRA and not an epitope of wildtype PDGFRA.

87. (Withdrawn) The method of claim 86, wherein the monoclonal antibody recognizes an epitope of a variant PDGFRA having the amino acid sequence as shown in SEQ ID NO: 4, 6, 8, 10, 12, 21, 23, or 25.

88. (Withdrawn) The method of claim 83, wherein the antibody is reactive to an epitope including the amino acid sequence shown in position(s) 842 of SEQ ID NO: 4, 841 and 842 of SEQ ID NO: 6, 845 and 846 of SEQ ID NO: 8, 561 and 562 of SEQ ID NO: 10, 565 and 566 of SEQ ID NO: 12, 561 of SEQ ID NO: 21, 559 and 560 of SEQ ID NO: 23, or 841 and 842 of SEQ ID NO: 25.

89 - 115. (Cancelled)

116. (New) A method of detecting a gastrointestinal stromal tumor (GIST) associated with an activating PDGFRA mutation in a subject, comprising determining whether the subject has an activating mutation in PDGFRA, and wherein the activating mutation comprise a variant nucleic acid sequence shown in position 2919 of SEQ ID NO: 3.

117. (New) The method of claim 116, comprising reacting at least one PDGFRA molecule contained in a clinical sample from the subject with a reagent comprising a PDGFRA-specific binding agent to form a PDGFRA:agent complex.

118. (New) The method of claim 117, wherein the PDGFRA molecule is a PDGFRA encoding nucleic acid or a PDGFRA protein.

119. (New) The method of claim 117, wherein the PDGFRA-specific binding agent is a PDGFRA oligonucleotide or a PDGFRA protein-specific binding agent.

120. (New) The method of claim 117, wherein the sample comprises a neoplastic cell or is prepared from a neoplastic cell.

121. (New) The method of claim 117 wherein the PDGFRA molecule is a PDGFRA encoding nucleic acid sequence.

122. (New) The method of claim 121, wherein the method comprises HPLC denaturation analysis of a PDGFRA encoding nucleic acid molecule.

123. (New) The method of claim 121, wherein the agent comprises a labeled nucleotide probe.

124. (New) The method of claim 123, wherein the nucleotide probe has a sequence selected from the group consisting of:

(a) SEQ ID NO: 3; or

(b) fragments of SEQ ID NO: 3 at least 15 nucleotides in length, and including the sequence shown in position 2919 of SEQ ID NO: 3.

125. (New) The method of claim 116, further comprising *in vitro* amplifying a PDGFRA nucleic acid prior to detecting the activating PDGFRA mutation.

126. (New) The method of claim 125, wherein the PDGFRA nucleic acid is *in vitro* amplified using at least one oligonucleotide primer derived from a PDGFRA-protein encoding sequence.

127. (New) The method of claim 126, wherein at least one oligonucleotide primer comprises at least 15 contiguous nucleotides from SEQ ID NO: 3.

128. (New) The method of claim 118, wherein the PDGFRA molecule is a PDGFRA protein.

129. (New) The method of claim 128, wherein the complexes are detected by western blot assay.

130. (New) The method of claim 128, wherein the complexes are detected by ELISA.

131. (New) The method of claim 128, wherein the PDGFRA-specific binding agent is a PDGFRA-specific antibody or a functional fragment thereof.

132. (New) The method of claim 131, wherein the agent is an antibody.

133. (New) The method of claim 132, wherein the antibody is a monoclonal antibody.

134. (New) The method of claim 133, wherein the monoclonal antibody recognizes an epitope of a variant PDGFRA and not an epitope of wildtype PDGFRA.